UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,168	06/26/2003	Thomas J. McIntyre	BA-00570	8253

22500 7590 08/01/2005

BAE SYSTEMS INFORMATION AND
ELECTRONIC SYSTEMS INTEGRATION INC.
65 SPIT BROOK ROAD
P.O. BOX 868 NHQ1-719
NASHUA, NH 03061-0868

EXAMINER	
CONNELLY CUSHWA, MICHELLE R	
ART UNIT	**PAPER NUMBER**
2874	

DATE MAILED: 08/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/608,168	MCINTYRE, THOMAS J.	
	Examiner	Art Unit	
	Michelle R. Connelly-Cushwa	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *10-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,8,9,15 and 18-21* is/are rejected.

7)☒ Claim(s) *6,7,16 and 17* is/are objected to.

8)☒ Claim(s) *1-21* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's Amendment filed May 20, 2005 has been fully considered and entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 15, 20 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Ide (US 2003/0081922 A1).

Regarding claims 1, 4, 15 and 21; Figure 9B of Ide discloses an integrated photonic device comprising:

- a substrate (10, 61);
- a photonic circuit/waveguide etched onto the substrate (the photonic circuit including the first core, 62);
- a cladding layer (63) positioned/vertically disposed on the waveguide and substrate, the cladding layer having a refractive index different from the circuit/waveguide; and

- an angled implantation/means to optically connect (68, which is angled at 90 degrees with respect to the substrate) disposed in the cladding layer (63), the angled implantation optically connecting the photonic circuit/waveguide (62) with an outer surface of the cladding layer (63);
- wherein the photonic circuit comprises a waveguide (63); and
- wherein the angled implantation/means substantially forms a parallelogram (the angled implantation/means, which is angled at 90 degrees with respect to the substrate, is a rectangle and a rectangle is a parallelogram all of whose angles are right angles).

Applicant is claiming the product including the process of making the photonic circuit/waveguide, and therefor claims 1 and 15 is of "product-by-process" nature. The courts have been holding for quite some time that: the determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made. *In re Thrope*, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985); and patentability of claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious. Applicant has chosen to claim the invention in the product form. Thus a prior art product which possesses the claimed product characteristics can anticipate or render obvious the claim subject matter regardless of the manner in which it is fabricated. A rejection based on 35 U.S.C. section 102 or alternatively on 35 U.S.C. section 103 of the status is eminently fair and acceptable. *In re Brown and Saffer*, 173 USPQ 685 and 688; *In re Pilkington*, 162 USPQ 147.

As such no weight is given to the process steps recited in claims 1 and 15.

Regarding claims 2, 3 and 20; the substrate comprises an oxide (the first cladding, 61, comprises silicon dioxide) and the second cladding (63) comprises silicon dioxide.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5, 8, 9, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ide (US 2003/0081922 A1).

Regarding claims 5 and 18; Ide discloses all of the limitations of claim 3, except for specifically teaching that the waveguide comprises SiON. Ide teaches that the substances of each cladding and/or each core are by no means limited to the materials disclosed, and that other materials may be used. SiON is commonly used to form planar optical waveguide structures in the art. Therefore, one of ordinary skill in the art would have been familiar with the practice of forming planar optical waveguides from silicon oxynitride (SiON) and the advantages associated therewith, including the sensitivity of SiON to UV light and properties that allow the material to be selectively and accurately etched for precise definition of waveguide structures. Thus, one of ordinary skill in the art would have found it obvious to use SiON to form the waveguide in the invention of Ide that is sensitive to UV light and that may be selectively and

accurately etched to precisely define the waveguide, since Ide teaches that other materials may be used, and SiON is commonly used in the art to form planar optical waveguide structures.

Regarding claim 8; Ide discloses all of the limitations of claim 8, except for specifically teaching that the angled implantation is formed of SiON. The angled implantation (68) connects the photonic circuit with an outer surface of the cladding layer. SiON is commonly used to form planar optical waveguide structures in the art. Therefore, one of ordinary skill in the art would have been familiar with the practice of forming planar optical waveguides from silicon oxynitride (SiON) and the advantages associated therewith, including the sensitivity of SiON to UV light and properties that allow the material to be selectively and accurately etched for precise definition of the waveguide structures. Thus, one of ordinary skill in the art would have found it obvious to use SiON to for the angled implantation in the invention of Ide that is sensitive to UV light and that may be selectively and accurately etched to precisely define the angled implantation, since Ide teaches that other materials may be used, and SiON is commonly used in the art to form planar optical waveguide structures.

Applicant is claiming the product including the process of making the angled implantation, and therefor claim 8 is of "product-by-process" nature. The courts have been holding for quite some time that: the determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made. *In re Thrope*, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985); and patentability of claim to a product does not rest merely on a difference in the method by

which that product is made. Rather, it is the product itself which must be new and unobvious. Applicant has chosen to claim the invention in the product form. Thus a prior art product which possesses the claimed product characteristics can anticipate or render obvious the claim subject matter regardless of the manner in which it is fabricated. A rejection based on 35 U.S.C. section 102 or alternatively on 35 U.S.C. section 103 of the status is eminently fair and acceptable. *In re Brown and Saffer*, 173 USPQ 685 and 688; *In re Pilkington*, 162 USPQ 147.

As such no weight is given to the process steps recited in claim 8.

Regarding claims 9 and 19; SiON has a refractive index of about 1.6 and SiO_2 has a refractive index of about 1.44.

Allowable Subject Matter

Claims 6, 7, 16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited on attached form PTO-892 is the most relevant prior art known, however, the invention of claims 6, 7, 16 and 17 distinguishes over the prior art of record for the following reasons.

Regarding claim 6; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an integrated photonic device as defined in claim 6, wherein the angled implantation forms

an angle of about 50 degrees with the substrate in combination with the limitations of the base claim.

Regarding claim 7; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an integrated photonic device as defined in claim 7, wherein the angled implantation forms an angle less than 50 degrees with the substrate in combination with the limitations of the base claim.

Regarding claim 16; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an integrated photonic circuit as defined in claim 16, wherein the means to connect the photonic waveguide with the outer surface forms an angle of about 50 degrees with the substrate in combination with the limitations of the base claim.

Regarding claim 17; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an integrated photonic circuit as defined in claim 16, wherein the means to connect the photonic waveguide with the outer surface forms an angle of less than 50 degrees with the substrate in combination with the limitations of the base claim.

Hence, there is no reason or motivation for one of ordinary skill in the art to use the prior art of record to make the invention of claims 6, 7, 16 and 17.

Response to Arguments

Applicant's arguments filed May 20, 2005 have been fully considered but they are not persuasive.

Regarding prior art rejections to claims 1-5, 8, 9, 15 and 18-20 over Ide (US 2003/0081922 A1); Applicant states that Ide does not disclose an angled implantation connecting a photonic circuit with an outer surface of a cladding layer; and that the doped portion, 68, in Figure 9A of Ide, forms a straight line and that a straight line has no angle to it.

The doped portion (68) in Figure 9A is at an angle of 90 degrees with respect to the substrate (10, 61), and, therefore is "angled". The Examiner notes that the implantation region (35) in Figures 1 and 2 of the present application forms a straight line and that the straight line is formed at an angle less than 90 degrees with respect to the substrate, while in the invention of Ide the doped region (68) forms a straight line that is formed at a 90 degree angle with respect to the substrate. The Examiner further notes that the limitation "angled implantation" set forth in claim 1 of the present application is particularly broad, since the claim language does not define what the implantation is "angled" with respect to.

Applicant further states that claim 15 has been amended to recite that the means to optically connect the photonic waveguide and an outer surface of a cladding layer is angled and substantially forms a parallelogram.

The means (68) to optically connect the photonic waveguide and an outer surface of a cladding layer is angled at 90 degrees with respect to the substrate in the invention of Ide (see discussion above). Additionally, the means (68) to optically

connect the photonic waveguide and an outer surface of a cladding layer forms a rectangle. Rectangles are parallelograms all of whose angles are right angles.

Regarding prior art rejections to claims 15-17 over Kuo et al. (US 5,446,814); the rejections have been withdrawn in view of Applicant's amendments to claim 15.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone

number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

Michelle R. Connelly-Cushwa
Primary Examiner
July 25, 2005